

WHAT IS CLAIMED IS:

1 1. A light emitting diode, comprising:
2 a semiconductor substrate;
3 a light-emitting region including an active layer provided
4 between a first conductivity type cladding layer formed on the
5 semiconductor substrate and a second conductivity type cladding
6 layer;
7 a transparent conductive film made of a metal oxide and
8 located over the light-emitting region;
9 a first electrode formed on the upper side of the
10 transparent conductive film;
11 a second electrode formed on the whole or a part of the
12 bottom of the semiconductor substrate; and
13 a layer for preventing exfoliation of the transparent
14 conductive film, the preventing layer being made of a compound
15 semiconductor containing at least aluminum and located between
16 the light-emitting region and the transparent conductive film.

1 2. The light emitting diode as defined in claim 1,
2 wherein:
3 the preventing layer contains a conductivity type
4 determination impurity at a concentration of $1 \times 10^{19} \text{ cm}^{-3}$ or
5 higher.

1 3. The light emitting diode as defined in claim 1,

2 wherein:

3 the preventing layer has a film thickness of 300 nm or less.

1 4. The light emitting diode as defined in claim 2,

2 wherein:

3 the preventing layer has a film thickness of 300 nm or less.

1 5. The light emitting diode as defined in claim 1,

2 wherein:

3 the transparent conductive film is made of indium tin
4 oxide.

1 6. The light emitting diode as defined in claim 2,

2 wherein:

3 the transparent conductive film is made of indium tin
4 oxide.

1 7. The light emitting diode as defined in claim 1,

2 wherein:

3 the preventing layer is made of an arsenic compound.

1 8. The light emitting diode as defined in claim 2,

2 wherein:

3 the preventing layer is made of an arsenic compound.

1 9. The light emitting diode as defined in claim 1,

2 wherein:

3 the light-emitting region is made of $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ ($0 \leq$
4 $x \leq 1, 0 \leq y \leq 1$).

1 10. The light emitting diode as defined in claim 2,

2 wherein:

3 the light-emitting region is made of $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ ($0 \leq$
4 $x \leq 1, 0 \leq y \leq 1$).

1 11. The light emitting diode as defined in claim 1,

2 wherein:

3 the preventing layer is an AlGaAs layer having a bandgap
4 which is smaller than that of the active layer; and

5 the AlGaAs layer is made of $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0.01 \leq x \leq 0.43$).

1 12. The light emitting diode as defined in claim 1,

2 wherein:

3 the AlGaAs layer has a carrier concentration of 1×10^{19}
4 cm^{-3} or higher.

1 13. The light emitting diode as defined in claim 11,

2 wherein:

3 the AlGaAs layer has a carrier concentration of 1×10^{19}
4 cm^{-3} or higher.

1 14. The light emitting diode as defined in claim 1,

2 wherein:

3 the AlGaAs layer is added with at least one of Zn, Be, and
4 Mg.

1 15. The light emitting diode as defined in claim 11,
2 wherein:

3 the AlGaAs layer is added with at least one of Zn, Be, and
4 Mg.

1 16. The light emitting diode as defined in claim 1,
2 wherein:

3 the AlGaAs layer is added with at least one of Zn, Be and
4 Mg, and C; and
5 C is autodoped.

1 17. The light emitting diode as defined in claim 11,
2 wherein:

3 the AlGaAs layer is added with at least one of Zn, Be and
4 Mg, and C; and
5 C is autodoped.

1 18. The light emitting diode as defined in claim 1,
2 wherein:

3 the AlGaAs layer is formed at a growth temperature of 600°C
4 or lower.

1 19. The light emitting diode as defined in claim 11,
2 wherein:

3 the AlGaAs layer is formed at a growth temperature of 600°C
4 or lower.

1 20. The light emitting diode as defined in claim 1,
2 wherein:

3 the AlGaAs layer is formed at a V/III ratio in raw materials
4 of 50 or less at the time of growth.

1 21. The light emitting diode as defined in claim 11,
2 wherein:

3 the AlGaAs layer is formed at a V/III ratio in raw materials
4 of 50 or less at the time of growth.

1 22. The light emitting diode as defined in claim 11,
2 wherein:

3 the transparent conductive film is made of indium tin
4 oxide.

1 23. The light emitting diode as defined in claim 11,
2 wherein:

3 the light-emitting region is made of $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$ ($0 \leq$
4 $x \leq 1$, $0 \leq y \leq 1$).